

The Genus *Bankia* GRAY (Pelecypoda) in the Oligocene of Washington

by

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A contribution from the University of California Museum of Paleontology, Berkeley, California
(3 Textfigures)

The family Teredinidae, including the genera *Teredo* Linnaeus and *Bankia* Gray, is a diverse and widely distributed group in Recent seas. However, the number of fossil species that have been described are relatively few, even though the genus *Teredo* is known from deposits as old as Jurassic and the genus *Bankia* is recorded from deposits of Paleocene age. The teredinids are not uncommon in the fossil record, but their presence is usually indicated only by burrows with calcareous linings in fossil wood, rather than by the shell or pallets. To separate *Teredo* from *Bankia* it is necessary to examine the siphonal pallets. These pallets, which seal the aperture of the burrow in case of need, consist of a calcareous stalk and blade and are covered by periostracum. In the genus *Bankia* the blade of the pallet is composed of a series of nested cones. In comparison the blade of the pallet of *Teredo* is entire. Previously, the ornamentation and shape of the shell have been used to delimit living and fossil species, but these features have been shown to be environmentally controlled and not constant for a species. More recently (i.e., Clench and Turner, 1946), the character of the periostracum covering the siphonal pallets has been considered significant at the specific level, but the periostracum is not readily preserved, and, consequently, fossil species must be defined on other characters. The morphology of the calcareous parts of the siphonal pallets appears to be of some value in specific determination, but detailed illustrations of this part of the pallet are seldom available, even for Recent species. Therefore, it is with some reservation that the following species is described. However, as this discovery represents, insofar as is known, the only fossil record of the genus *Bankia* in the eastern Pacific, and as the specimens are not readily comparable with any known species, Recent or fossil, the description of this species appears justified.

Several shells and pallets of this new species of *Bankia* were collected from the middle Oli-

gocene Lincoln formation near Porter, Washington. The specimens are preserved in unfilled burrows in a fragment of wood (*Morus*?) embedded in a concretion about 160 mm. long and 90 mm. wide. Most of the material is coated to varying degrees with calcite, but the details of one pallet are exceptionally well preserved (text fig. 1). This new species is described as follows:

Family TEREDINIDAE LATREILLE, 1825

Genus *Bankia* GRAY, 1840

Bankia lincolnensis DURHAM & ZULLO, spec. nov.

(Figures 1, 2, and 3)

Description: Shell similar to that of other species of the genus *Bankia*, equivalve, strongly convex, gaping widely anteriorly; exterior of shell not visible; interior of shell covered with thin coating of calcite; lobe a little more than one-third length of anterior margin of disc; auricle placed centrally on posterior margin of disc, not produced posteriorly; apophysis flattened dorsoventrally, extending ventrally beyond center of shell; pallets consisting of series of closely-spaced cones; calcareous part of each cone funnel-shaped, semi-circular in cross-section, with inner margin higher than outer margin; inner margin nearly straight; outer margin slightly concave on either side of low, median convexity; lateral edges of calcareous part of each cone produced into long, narrow, vertically extended "awns"; stalk of pallet long, length about five times width of proximal cone, circular in outline.

Dimensions: Holotype UCMP no. 34'672; length of burrow 56 mm.; maximum width of burrow 6 mm.; width of distal cone of pallet 2 mm. Paratype UCMP no. 34'675; height of shell 5 mm.; length of shell 5 mm.

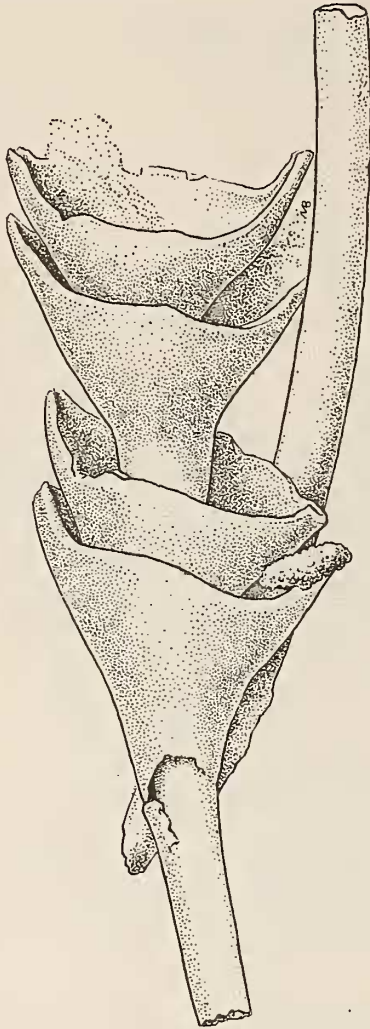


Fig. 1. *Bankia lincolnensis* DURHAM & ZULLO, spec. nov.
Holotype, UCMP no. 34672, x 9.6
outer view of incomplete pallet (secondary deposits
of calcite only partially indicated).

Holotype: University of California, Museum
of Paleontology no. 34'672.

Paratypes: University of California, Museum
of Paleontology nos. 34'673, 34'674, 34'675.

The specific name "lincolnensis" is derived
from the Lincoln formation in which the speci-
mens occurred.

Occurrence: University of California, Muse-
um of Paleontology locality A-8724, middle
Oligocene Lincoln formation, "type Porter" lo-
cality. Southeast quarter of the northeast quar-
ter of Section 28, T. 17 N., R. 5 W. Twenty-
foot stratigraphic interval along cliffs on north-
east side of State Highway 9 for a distance of
one-half mile immediately southeast of Porter
Creek.

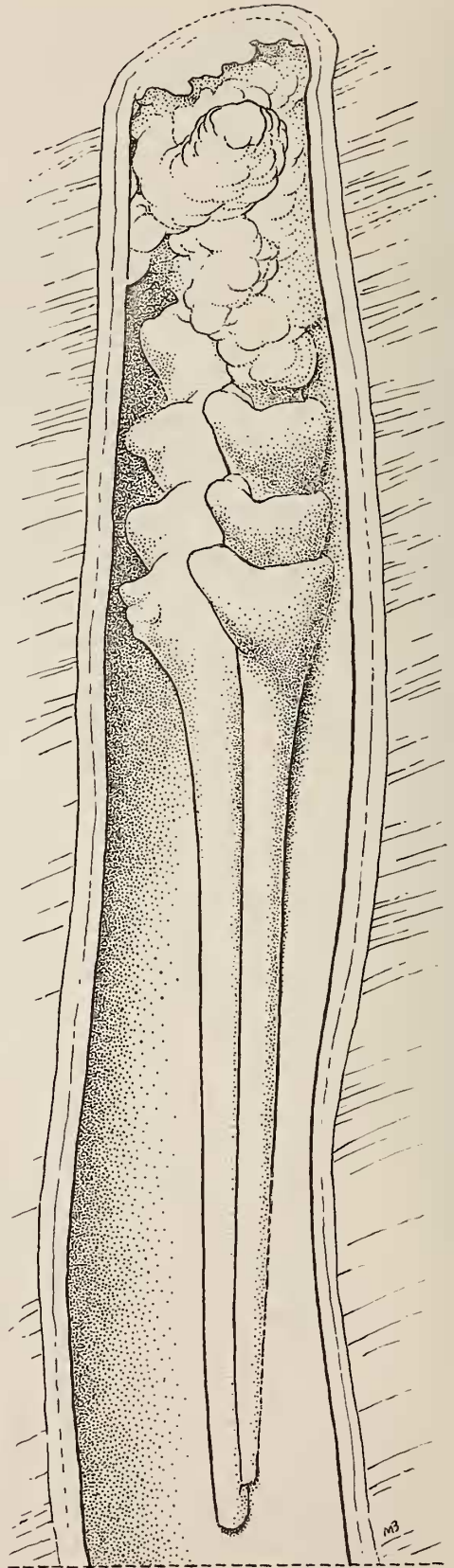


Fig. 2. *Bankia lincolnensis* DURHAM & ZULLO, spec. nov.
Paratype, UCMP no. 34673, x 19.2
paired pallets heavily coated with secondary deposits.

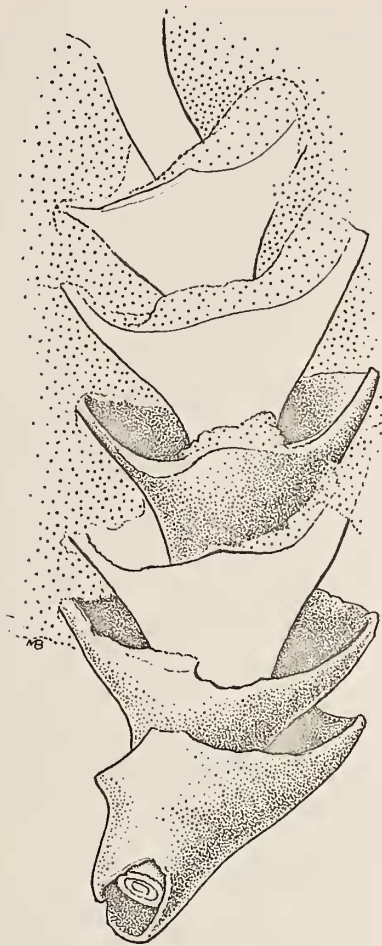


Fig. 3. *Bankia lincolnensis* DURHAM & ZULLO, spec. nov.
Paratype, UCMP no. 34674, x 9.6
outer view of series of cones partially
embedded in matrix.

Discussion: The pallets were compared with those of 1) the Recent eastern Pacific species *Bankia setacea* (Tryon) and *B. zeteki* Bartsch; 2) the Recent western Atlantic species (after Clench and Turner, 1946) *B. gouldi* Bartsch, *B. caribbea* Clench and Turner, *B. katherinae* Clench and Turner, *B. destructa* Clench and Turner, *B. fimbriatula* Moll and Roch, *B. fosteri* Clench and Turner, and *B. cieba* Clench and Turner; 3) the Recent western Pacific species *B. australis* Calman and *B. debenhami* Iredale, and the New Zealand Oligocene species *B. turneri* Powell and Bartrum; and 4) the European fossils figured by Moll (1942, pl. 24).

The vertically projected "awns" developed on the calcareous part of the cone of the pallet serve to distinguish *Bankia lincolnensis* from the above mentioned species. *Bankia lincolnensis* most closely resembles species of the subgenus *Neobankia* Bartsch in the character of the pallets.

Teredid borings have been reported (as *Teredo* sp.) from both Cretaceous and Tertiary formations on the Pacific Coast of North America including the following: Cretaceous, Santa Ana Mountains, Southern California (Packard, 1916, p. 147); Paleocene, Martinez formation, California (Dickerson, 1911, p. 173; 1914a, pp. 73, 78, 82, 86, 101; 1914b, p. 295); Paleocene, Meganos formation, California (Clark and Woodford, 1927, p. 103); late Eocene, Tejon formation, California (Dickerson, 1916); late Eocene, Cowlitz formation, Washington (Weaver, 1916, p. 24); Oligocene, San Lorenzo formation, California (Clark, 1918, p. 162); middle Oligocene, "Porter", Washington (Van Winkle, 1918, p. 77); middle Oligocene, Vancouver Island, British Columbia (Merriam, 1896, p. 104); early Miocene, Vaqueros formation, California (Loel and Corey, 1932, p. 234); early Miocene, Sooke formation, Vancouver Island, British Columbia (Clark and Arnold, 1923, p. 156); late Miocene, "Santa Margarita" formation, California (Nomland, 1917, p. 302). Personal observation indicates that fossil teredinids are more common on the Pacific Coast than is indicated by the records listed above, but they have largely been ignored.

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A New *Vexillum* (Mitridae) from the Philippine Islands

by

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(Plates 1 and 2 and one Textfigure)

About a year ago I received a shipment of *Mitra* species from various parts of the Philippine Archipelago; among these was a specimen from Balabac Island labelled *Vexillum regina* (Sowerby, 1825) which aroused my curiosity because its color seemed to differ from that of other specimens I had seen. Further investigation brought out that there were several additional differences between this specimen and the typical *V. regina*: first, it was not sharply shouldered; further, the surface sculpture was far less coarse than in Sowerby's original figure of *V. regina*, and the color pattern was arranged in a different manner. In the course of working out a solution as to what this species might be, additional problems arose involving other closely related species; these, however, will be dealt with in a subsequent paper.

A careful search through all the known monographs and many other papers on Mitridae failed to turn up anything resembling the Balabac species. It therefore seemed likely that this was an undescribed taxon, but as nearly 100 years had passed since the last comprehensive monograph had been compiled for the family Mitridae, this was not an adequate basis for describing a new species. Consequently, in addition to perusal of all available literature, as thorough a search as possible was made among many of the larger museums and private collections to make certain that this species was indeed new and hitherto undescribed. This

search turned up two specimens, also labelled *Vexillum regina* (Sowerby, 1825), which match my specimen fairly closely; both are from private collections and were collected in the southern Philippines.

Wherever it was not possible to visit collections personally, Ektachrome color transparencies of the dorsal and ventral aspects ($\frac{2}{3}$ actual size) were submitted for comparison with other collections; without exception these transparencies were returned promptly and with a notation to the effect that nothing similar existed in that particular collection. Most of the responses stated that it superficially resembled *Vexillum regina* (Sowerby, 1825). Regrettably, due to a change in personnel taking place at the time of this search, the Mollusca Section of the British Museum (Natural History) was not able to compare the photographs with the specimens in its collection; it is felt, however, that the remaining institutional and private collections which participated represent a good cross-section of the material available in this *Vexillum* complex. For the prompt and courteous response so willingly given in all instances, I wish to express my gratitude to the following persons and institutions cooperating: Dr. William J. Clench and Dr. Ruth D. Turner, Museum of Comparative Zoology, Harvard University; Dr. Alan Solem, Chicago Natural History Museum; Mr. William Old, Jr., New York Museum of Natural History; Dr. Myra Keen, Stanford University; Dr. Leo G. Hertlein, Cali-